

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. **(Currently Amended)** A matched filter for implementing the correlation of input signals and reference signals, the matched filter comprising:
  - first means for storing M samples taken from N input signals, wherein  $N \geq 2$ , and in which said M samples of the N input signals are stored one sample at a time at said N input signals' frequencies;
  - second means for storing K M-sample long reference signals, wherein  $K \geq 2$  and said M-sample long reference signals correspond to more than one transmitter;
  - multiplexing means for applying one of said N input signals and one of said M-sample long reference signals at a time from said first and second storage means to calculation means by applying alternately at least one combination of the N input signals and the M-sample long reference signals; and
  - calculation means for calculating the correlation time-dividedly for a combination of said N input signals and said M-sample long reference signals so that correlation results calculated from different signals appear at the output of the calculation means as a sequence.

2. **(Previously Presented)** A matched filter as claimed in claim 1, wherein said calculation means comprises a comparator for comparing each

sample of the N input signals with the corresponding sample of the M-sample long reference signals and gives M 1-bit comparison results, and an adder means for summing up said M 1-bit comparison results and generating a correlation result at the output of the filter.

3. **(Original)** A matched filter as claimed in claim 2, wherein said comparator is one of the following: a multiplier, an XOR circuit or an XNOR circuit.

4. **(Currently Amended)** A matched filter for implementing the correlation of input signals and reference signals, the matched filter comprising:  
first means for storing M samples taken from N input signals and for storing said M samples of the N input signals one at a time at said N input signals' frequencies;

second means for storing K M-sample long reference signals, wherein K>2 and said M-sample long reference signals correspond to more than one transmitter;

multiplexing means for applying one of said N input signals and one of said M-sample long reference signals at a time from said first and second storage means to calculation means by applying alternately at least one combination of the N input signals and the M-sample long reference signals to the calculation means; and

calculation means for calculating the correlation time-dividedly for each combination of said N input signals and said M-sample long reference signals so that correlation results calculated from different combinations appear at the output of the calculation means as a sequence.

5. **(Previously Presented)** A matched filter as claimed in claim 4, wherein said calculation means comprises a comparator for comparing each of said M samples of the N input signals with a corresponding sample from said M-sample long reference signals and gives M 1-bit comparison results, and an adder means for summing up said M 1-bit comparison results and generating a correlation result at the output of the filter.

6. **(Original)** A matched filter as claimed in claim 5, wherein said comparator is one of the following: a multiplier, an XOR circuit or an XNOR circuit.

7. **(Currently Amended)** A spread spectrum receiver comprising a device for detecting a demodulated signal, received by the receiver and converted into digital samples, the device comprising a matched filter for calculating the correlation between an input signal and at least one reference signal, and a controller for comparing the correlation results generated by the matched filter with a predetermined threshold value to determine if a signal is found, the matched filter comprising:

first means for storing M samples taken from N input signals, wherein  $N \geq 2$ , and in which M samples of the N input signals are stored one sample at a time at a frequency of each of the N input signals;

second means for storing K M-sample long reference signals, wherein  $K \geq 2$  and said M-sample long reference signals correspond to more than one transmitter;

multiplexing means for applying one of said N input signals and one of said M-sample long reference signals at a time from said first and second storage means to calculation means by applying alternately at least one combination of the N input signal and the M-sample long reference signal to the calculation means; and

calculation means for calculating the correlation time-dividedly for a combination of said N input signals and said M-sample long reference signals so that correlation results calculated from different signals appear at the output of the calculation means as a sequence.

8. **(Previously Presented)** A spread spectrum receiver as claimed in claim 7, wherein said calculation means comprises a comparator for comparing each sample of the N input signals with a corresponding sample from the M-sample long reference signals and gives M 1-bit comparison results, and an adder means for summing up said M 1-bit comparison results and generating a correlation result at the output of the filter.

9. **(Original)** A spread spectrum receiver as claimed in claim 8, wherein said comparator is one of the following: a multiplier, an XOR circuit or an XNOR circuit.

10. **(Previously Presented)** A spread spectrum receiver as claimed in claim 7, wherein the outputs of the matched filter are complex correlation samples, and that said device comprises an arithmetic unit for squaring both components of the complex correlation sample and sums up the squared components.

11. **(Previously Presented)** A spread spectrum receiver as claimed in claim 10, wherein the arithmetic unit sums up the correlation sample corresponding to the same phase difference of two or more input signals, the sum corresponding to a correlation result that is calculated with one phase difference and whose integration time is  $M \cdot L$  samples, wherein M is the length of the matched filter in number of samples and L is the number of correlation samples summed up by an accumulator.

12. **(Previously Presented)** A spread spectrum receiver as claimed in claim 7, wherein said controller processes several comparison results corresponding to the same phase difference and M-sample long reference signal, and, in response to a predetermined proportion of the gathered comparison

results indicating that the output value exceeded said threshold value, declares the signal found.

13. **(Currently Amended)** A spread spectrum receiver comprising a device for detecting a demodulated signal, received by the receiver and converted into digital samples, the device comprising a matched filter for calculating the correlation between an input signal and at least one reference signal, and a controller for comparing the correlation results generated by the matched filter with a predetermined threshold value to determine if a signal is found, said matched filter comprising:

first means for storing M samples taken from N input signals, wherein  $N \geq 1$ , and in which said M samples of the N input signals are stored one sample at a time at a sample frequency for each of said N input signals;

second means for storing K M-sample long reference signals, wherein  $K \geq 2$  and said M-sample long reference signals correspond to more than one transmitter;

multiplexing means for applying one of said N input signals and one of said M-sample long reference signals at a time from said first and second storage means to calculation means by applying alternately at least one combination of the N input signals and one of the M-sample long reference signals to the calculation means; and

calculation means for calculating the correlation time-dividedly for each combination of the N input signals and the M-sample long reference signals

so that correlation results calculated from different combinations appear at the output of the calculation means as a sequence.

14. (New) The matched filter of claim 1, further comprising a receiving means for receiving said N input signals from a pre-processing means, wherein said N input signals are each comprised of an I component and a Q component, and wherein said pre-processing means is to process an  $I_{in}$  signal a  $Q_{in}$  signal for each of said N input signals to provide corresponding  $I_{out}$  signals and  $Q_{out}$  signals to said receiving means.

15. (New) The matched filter of claim 14, wherein said pre-processing means is to generate said  $I_{out}$  signals and  $Q_{out}$  signals as follows:

$$ACC_I = I_{in} \cdot \cos(LO),$$

$$I_{out} = ACC + Q_{in} \cdot \sin(LO),$$

$$ACC_Q = Q_{in} \cdot \cos(LO), \text{ and}$$

$$Q_{out} = ACC - I_{in} \cdot \sin(LO)$$

where,

$ACC_I$  is an initial accumulation register value for  $I_{out}$ ,

$ACC_Q$  is an initial accumulation register value for  $Q_{out}$ , and

LO is a local oscillator frequency.

16. (New) The matched filter of claim 4, further comprising a receiving means for receiving said N input signals from a pre-processing means, wherein

said N input signals are each comprised of an I component and a Q component, and wherein said pre-processing means is to process an  $I_{in}$  signal a  $Q_{in}$  signal for each of said N input signals to provide corresponding  $I_{out}$  signals and  $Q_{out}$  signals to said receiving means.

17. (New) The matched filter of claim 16, wherein said pre-processing means is to generate said  $I_{out}$  signals and  $Q_{out}$  signals as follows:

$$ACC_I = I_{in} \cdot \cos(LO),$$

$$I_{out} = ACC + Q_{in} \cdot \sin(LO),$$

$$ACC_Q = Q_{in} \cdot \cos(LO), \text{ and}$$

$$Q_{out} = ACC - I_{in} \cdot \sin(LO)$$

where,

$ACC_I$  is an initial accumulation register value for  $I_{out}$ ,

$ACC_Q$  is an initial accumulation register value for  $Q_{out}$ , and

LO is a local oscillator frequency.